AMENDMENTS TO THE CLAIMS:

1. **(Currently Amended)** A method of tag-directed synthesis of a plurality of compounds, comprising:

(a) forming a first group of subsets of nucleic acid tags for participating in a first synthetic reaction step, **wherein each nucleic acid tags comprises a first hybridization sequence linked to a second hybridization sequence, which said second hybridization sequence is linked to a chemical reaction site and** where the nucleic acid tags in each subset each has a selected one of a plurality of different first hybridization sequences, **and** a mixture of different second hybridization sequences~~, and a chemical reaction site~~, by contacting said nucleic acid tags with a plurality of first immobilized nucleotide sequences, each designed to capture a subset of said tags by hybridization between one of said ~~tag~~ first hybridization sequences and the ~~associated~~ first immobilized sequence;

(b) carrying out the first synthetic step by reacting the chemical reaction sites in each of the subsets formed in (a) with a selected one of a plurality of first reagents, thereby to convert the **chemical** reaction site in each tag to a reagent-specific compound intermediate on the ~~associated~~ **nucleic acid** tag in each subset;

(c) forming a second group of subsets of the ~~reacted~~ nucleic acid tags ~~formed in~~ **of** step (b), for participation in a second synthetic reaction step, by contacting said ~~reacted~~ nucleic acid tags with a plurality of second immobilized nucleotide sequences, each designed to capture a subset of said **nucleic acid** tags by hybridization between one of said ~~tag~~ second hybridization sequences and the ~~associated~~ second immobilized sequence; and

(d) carrying out the second synthetic step by reacting the **reagent-specific** compound intermediate ~~in the associated tags~~ **of the nucleic acid tag** in each of the subsets formed in (c) with a selected one of a plurality of second reagents.

2. **(Cancelled)**

3. **(Previously presented)** The method of claim 1, for use in forming a plurality of oligomers with different subunit sequences, wherein the plurality of first and second reagents in steps (b) and (d) include different oligomer subunits.

4. **(Previously presented)** The method of claim 1, for use in forming a plurality of compounds with different substituents, wherein the plurality of first and second reagents in steps (b) and (d) include different compound substituents.

5. **(Currently Amended)** The method of claim 1 for making a plurality of compounds requiring more than 2 synthetic steps wherein the nucleic acid tags include an additional step-specific subset of hybridization sequences for each synthetic step N greater than 2 and which further comprises, for each additional synthetic step N;

(e) forming an Nth group of subsets of reacted nucleic acid tags for participating in the Nth reaction step, by contacting said nucleic acid tags with a plurality of Nth immobilized nucleotide sequences, each designed to capture a subset of said tags by hybridization between one of said tag Nth hybridization sequences and the ~~associated~~ Nth immobilized sequence;

(f) reacting the compound intermediates in the ~~associated~~ tags in each of the subsets formed in (e) with a one of a plurality of Nth-reaction reagents; and

(g) repeating steps (e) and (f) if necessary, until synthesis of the compounds is complete.

6. **(Previously presented)** The method of claim 5 wherein each subset of nucleic acid tags includes at least 5 separate hybridization sequences.

7. **(Original)** The method of claim 1, wherein said nucleic acid tags within each subset further comprises for each subset of hybridization sequences, an adjacent spacer sequence separating that hybridization sequence from an adjacent one, each of said spacer sequences being the same for all subsets of nucleic acid tags and each hybridization sequence being different for each group of subsets of nucleic acid tags.

8. **(Currently Amended)** The method according to claim 1, for use in enriching the plurality of compounds **for those** ~~in those~~ having a desired compound activity, further comprising identifying from said plurality of compounds, one or more compounds having a desired activity to yield a subpopulation of nucleic acid tags, and using the subpopulation to carry out the method of claim 1.

9. **(Previously presented)** The method according to claim 8, wherein said using includes;

amplifying said subpopulation of nucleic acid tags by polymerase chain reaction (PCR),

adding a chemical reaction site, and

using said amplified subpopulation having chemical reaction sites to carry out the method of claim 1.

10. (**Original**) The method according to claim 9, for use in producing new permutations of active compounds wherein said nucleic acid tags have one of a plurality of spacer sequences, each of said spacer sequences having a unique restriction enzyme site;

(e) identifying from said plurality of compounds, one or more compounds having a desired activity to yield a subpopulation of nucleic acid tags;

(f) treating said subpopulation of nucleic acid tags with one or more restriction enzymes under conditions effective to produce a partial digest;

(g) rejoining said partially digested nucleic acid tags;

(h) adding a new chemical reaction site to said partially digested nucleic acid tags and using the subpopulation to carry out the method of claim 1.

11.-14. (**Canceled**)

15. (**Currently Amended**) The method of claim 1, wherein each of said **first and second immobilized** nucleotide sequences are each bound to the surface of a solid phase reagent.

16. (**Currently Amended**) The method of claim 1, wherein said ~~reacting~~ steps (b) and (d) include first transferring the separate subsets of said tags from said immobilized sequences to **a** solid support **prior to said reacting**.